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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,352	08/01/2003	Will Watson	DKT91043H	3974
7590 03/20/2006				
BorgWarner Inc. Patent Administrator 3850 Hamlin Road Auburn Hills, MI 48326-2872			EXAMINER VANAMAN, FRANK BENNETT	
			ART UNIT 3618	PAPER NUMBER

DATE MAILED: 03/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/632,352

Applicant(s)

WATSON ET AL.

Examiner

Frank Vanaman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 82-107 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 82-107 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>9/1/03</u> | 6) <input type="checkbox"/> Other: _____ |

Election/Restriction

1. Applicant's comment concerning the election of sub-species (originally set forth by the examiner to be directed to either figure 5a or figure 5b) is noted and has been considered persuasive. The examiner agrees that a more accurate set of subspecies would have properly included figure 1 as well. The requirement for an election of sub-species is hereby withdrawn.

Information Disclosure Statement

2. Applicant's Information Disclosure Statement is acknowledged. A list comprising two pages of citations has been provided, which citations have been initialed by the examiner. The examiner notes that the pages are labeled "1 of 3" and "2 of 3", however no third page is present in the list.

Claim Objections

3. Claim 82 is objected to because of the following informalities: in claim 82, line 4, "at lease" should be - at least - . Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. Claims 88, 89, 94-96, 98, and 104-106 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 88, 94, and 104, the recitation of a controller providing minimum electrical current appears contradictory to the recitations of the independent claims, which refers to application of current which increases; in claims 89, 95 and 105, the recitation of reduction of steps associated with a minimum current increase is not entirely clear; in claim 98 it is not entirely clear what aspect of a step is a function of throttle position or brake system activation (e.g., magnitude, time, number, etc.).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 82, 85, 87, 88, 90, 91, 94, 96, 99, 102, 103, 104, 106 and 107 are rejected under 35 U.S.C. 102(b) as being anticipated by Miller et al. (US 4,989,686, cited by applicant). Miller et al. Teach a vehicle having a first drive line with a first drive shaft (42) a first differential (56), first axles (18) and first wheels (14), as well as a second drive line having a second drive shaft (44) a second differential (66) second axles (16) and second wheels (12); each line having at least one average speed sensor (104, 102) to determine a drive line speed; a transfer case having an input (41) connectable to one or both of two outputs (e.g., shafts 42, 44) and a clutch (46) operatively disposed between the first and second outputs and actuated by a coil (70) driven electrically by a microcomputer controller (100) which receives speed signals from the drive line speed sensors (102, 104), determines the difference between the speed signals (col. 8, lines 53-55); causes an increase of electrical current to the clutch in response to the difference in speed signals exceeding a computed threshold (col. 8, line 64 through col. 9, line 24); and continuing step increases of the current in response to the difference remaining greater than the threshold (col. 9, lines 28-65; note as well at col. 11, lines 58-62); decreasing the current in response to the difference being less than the threshold ('return time', figure 9); wherein a minimum electrical value, as best understood, is applied as set by the torque level output, which level is set by calculation and delivered to the clutch based on the throttle opening and engine speed (col. 10, lines 45-54) and which is applicable in conditions where wheel slip is not present.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 83, 84, 86, 89, 92, 93, 95, 97, 98, 100, 101 and 105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. The reference to Miller et al. is discussed in detail above and fails to explicitly teach certain features:

As regards claims 83, 92 and 100, the reference to Miller et al. fails to explicitly teach the steps as being equal in value. In output devices commonly used with microcomputers (e.g., D/A converters), and which are used to output digital data derived from a computing device to an analog device, it is exceptionally well known to provide each increment of resolution of the converter to be of equal value, and it would have been obvious to one of ordinary skill in the art at the time of the invention to provide each step level to be equal in value to the others for the purpose of allowing the use of the commonly available converters, thus reducing cost.

As regards claims 84, 93, and 101, the reference to Miller et al. fails to explicitly teach the steps being equal in duration. It is very well known to operate a microcomputer program in a cyclic manner (i.e., a loop) which runs a set of instructions repeatedly, taking the same time for each running of the loop. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to increment and decrement the steps such that they are of equal duration (i.e., each with the same number of loop steps) so as not to require additional program steps to implement variable durations.

As regards claims 86, 89, 95, 98 and 105, the reference to Miller et al. fails to explicitly teach that the amounts of the steps are reduced when the minimum values of current is increased. Inasmuch as it is well known to set the resolution of an operating system based on the values of minimum and maximum output, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the same number of steps between no wheel-slip engagement, and full wheel-slip engagement even should the minimum torque level derived from at least a throttle position sensor set at the no-wheel-slip condition be changed, thus allowing the same resolution between no-wheel-slip and full-wheel slip. Inasmuch as it would not be obvious to increase the maximum value (i.e., in order to prevent damage to the clutch), it would be deemed obvious to reduce the step sizes to maintain the resolution.

As regards claim 97, the reference to Miller et al. fails to specifically teach the provision of a greater number of steps corresponding to smaller step magnitudes, it is well known that an increase in resolution (i.e., more steps) constrained to a given range

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will result in steps of smaller magnitude, as such, it would have been obvious to one of ordinary skill in the art at the time of the invention to form a relationship wherein a greater resolution for a given engagement range is provided, for the purpose of providing finer control, and resulting in the step sizes being reduced.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kameda (US 5,226,502), Masaki (US 5,257,192) and Nakayama (US 5,265,020) teach torque distribution and drive controls of pertinence.

10. Any inquiry specifically concerning this communication or earlier communications from the examiner should be directed to F. Vanaman whose telephone number is 571-272-6701.

Any inquiries of a general nature or relating to the status of this application may be made through either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A response to this action should be mailed to:

Mail Stop _____
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450,

Or faxed to:

PTO Central Fax: 571-273-8300

F. VANAMAN
Primary Examiner
Art Unit 3618



3/13/06